(032350.B373)

ATTORNEY' TI-33227

WHAT IS CLAIMED IS:

A method of forming a semiconductor device, comprising:

forming a body region of a semiconductor substrate; forming a drift region adjacent at least a portion of the body region, using a dopant;

forming a field oxide structure adjacent a portion of the drift region and a portion of a drain region, wherein the field oxide structure is located between a gate electrode region and the drain region and is spaced apart from the gate electrode region;

wherein atoms of the dopant accumulate adjacent a field oxide structure forming the of intermediate-doped region adjacent a portion of the field oxide structure;

forming a gate oxide adjacent a portion of the body region; and

forming a gate electrode adjacent a portion of the gate oxide.

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- The method of Claim 1, wherein the dopant 2. comprises phosphorous.
- wherein the 1, Claim method of The higher region has intermediate-doped 25 concentration than a doping concentration of the drift region.
- The method of Claim 1, further comprising 4. forming a drain implant at the drain region, the drain 30 implant having a higher doping concentration than a doping concentration of the intermediate-doped region.

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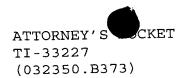
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- 5. The method of Claim 1, further comprising (%) forming a buried layer of the semiconductor substrate, wherein the buried layer is adjacent a portion of the body region.
- 6. The method of Claim 1, further comprising forming a local oxidation on silicon (LOCOS) isolation structure adjacent a portion of the drain region.
- 7. The method of Claim 5, wherein the LOCOS isolation structure is formed at approximately the same time as the field oxide structure.
- 15 8. The method of Claim 1, further comprising forming a spacer structure adjacent a portion of the gate electrode.
- 9. The method of Claim 1, further comprising 20 forming a drain contact at the drain region, the drain contact operable to facilitate a flow of electric current through the semiconductor device.

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- 10. A semiconductor device, comprising:
- , a body region of a semiconductor substrate;
- /a drift region adjacent at least a portion of the body region, the drift region comprising a dopant;
- a field oxide structure adjacent a portion of the drift region and a portion of a drain region, wherein the field oxide structure is located between a gate electrode region and the drain region and is spaced apart from the gate electrode region;
- an intermediate-doped region adjacent a portion of the field oxide structure, the intermediate-doped region comprising dopant atoms accumulated proximate the field oxide structure;
- a gate oxide adjacent a portion of the body region;
 - a gate electrode adjacent a portion of the gate oxide.
- 11. The semiconductor device of Claim 10, wherein 20 the dopant comprises phosphorous.
 - 12. The semiconductor device of Claim 10, wherein the intermediate-doped region has a higher doping concentration than a doping concentration of the drift region.
 - 13. The semiconductor device of Claim 10, further comprising a drain implant at the drain region, the drain implant having a higher doping concentration than a doping concentration of the intermediate-doped region.

14. The semiconductor device of Claim 10, further comprising a buried layer of the semiconductor substrate, wherein the buried layer is adjacent a portion of the body region.

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- 15. The semiconductor device of Claim 10, further comprising a local oxidation on silicon (LOCOS) isolation structure adjacent a portion of the drain region.
- 16. The semiconductor device of Claim 10, further comprising a spacer structure adjacent a portion of the gate electrode.
- 17. The semiconductor device of Claim 10, further comprising a drain contact at the drain region, the drain contact operable to facilitate a flow of electric current through the semiconductor device.
- 18. The semiconductor device of Claim 10, wherein a 20 relationship between a doping concentration of the semiconductor device and a lateral distance from the drift region is generally linear.